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Reviews of Foreign Literature.

Monographia Juncacearum. Franz Buchenau. Engler's Bot. Jahrb., XII 1-495, (mit Tafel I-III und 9 Holzschnitten). 1890.

Pages 1 to 5 contain a description of the order, references to the principal literature, and an analytical key to the nine genera.

Pages 1 to 60 make up a comparative account of the Juncaceæ, each organ and each relationship being discussed in detail. Especially noteworthy among these observations are those on vicarious species and genealogical relationship. A list of twenty pairs or groups of species is given, in which the members of each group are closely related, but have separate, often widely separate geographical range. *Marsippospermum*, *Rostkovia*, and the several sub-genera of *Luzula* and *Juncus* have been derived, it is believed, from a type form similar to the "*Junci poiophylli*," of which *J. bufonius* and *J. tenuis* are examples. It is to be noted that the genera *Marsippospermum* and *Rostkovia* are represented as branching from subgenera of *Juncus*. The author, therefore, does not consider that groups of species, in order to be entitled to separate generic rank, must possess co-ordinate differentiation; but that one existing genus may have been derived from a form belonging to another existing genus.

Pages 60 to 463 contain the systematic part proper of the monograph. Of the nine genera, *Distichia*, *Patosia* and *Oxychloë*, are confined to the mountains of South America; *Marsippospermum* and *Rostkovia* to New Zealand, southern South America and the adjacent islands; *Pronium* to the Cape of Good Hope; *Luzula* and *Juncus* are widely distributed, and *Thurnia*, doubtfully classed with the Juncaceæ, is found only in British Guiana.

The number of species in each genus is as follows :

	Total.	North American, north of Mexico.	Mexican, additional.
<i>Distichia</i> ,	3	0	0
<i>Patosia</i> ,	1	0	0
<i>Oxychloë</i> ,	1	0	0
<i>Marsippospermum</i> ,	2	0	0
<i>Rostkovia</i> ,	1	0	0
<i>Pronium</i> ,	1	0	0
<i>Luzula</i> ,	51	8 (besides <i>L. Carolina</i>)	3
<i>Juncus</i> ,	176	65	3
<i>Thurnia</i> ,	2	0	0

Of these species of *Luzula*, two are new to North America, *L. glabrata*, Desv. (Rocky Mountains, Lyall, Howell), and *L. confusa*, Lindenberg. (White Mountains, etc.) This White Mountain plant has been called *L. arcuata*, but that is found only farther north. *L. divaricata*, Watson, is referred to *L. parviflora*, Desv., and *L. spadicea* of American authors and its varieties become *L. parviflora*, Desv., the true *L. spadicea*, DC., not being credited to America. *L. Carolinæ*, Watson, is quoted with the original description and the note "Planta mihi ignota, caruncula deficiente a *L. pilosâ* valde diversa videtur" added, but the species is not numbered with the rest.

The greater part of the monograph, pp. 167-463, is devoted to *Juncus*. The genus is separated into eight sub-generic groups: Subulati, Poiophylli, Genuini, Thalassici, Septati, Alpini, Singulares, Graminifolii, of which all but two, Subulati and Singulares, are represented in North America. The group Ensifolii of Engelmänn is included in the Septati.

The new species and the changes of specific names from the current American nomenclature are condensed into the following table. The species, as recognized by Buchenau, are printed in Roman type, the synonyms in italics.

- Juncus Mexicanus*, Willdenow = *J. compressus*, H.B.K.
 " *acutus sphaerocarpus*, Engelmänn = *J. robustus*, Watson.
 " *brachycephalus* Buchenau, n. sp. = *J. Canadensis brachycephalus*, Engelm.
 " *trigonocarpus*, Steudel = *J. caudatus*, Chapman.
 " *ensifolius*, Wikström = *J. xiphioides triandrus*, Engelm. in part.
 " *Engelmanni*, Buchenau = *J. scirpoides polycephalus*, " " "
 " *crassifolius*, Buchenau, n. sp. = " " " "
 " *dubius*, Engelmänn = " *J. rugulosus*, Engelmänn.
 " *paucicapitatus*, Buchenau, n. sp. = a Sitkan plant collected by Mertens.
 " *lamprocarpus*, Ehrhart, = *J. articulatus*, L.
 " *Regelii*, Buchenau, n. sp. = Suksdorf, No. 678, (1885); M. E. Jones, *J. longistylis latifolius*, without number and No. 1199, (Utah).
 " *latifolius*, Buchenau, n. sp. = *J. longistylis latifolius*, Engelm.

In addition several changes in the disposition of varieties and their names are made, and a few of the species are arranged so as to show relationships different from those indicated by Engelmänn. In only one case (that of *Juncus rugulosus*) has one of

Engelmann's species been referred to a species previously described. *Juncus Breweri*, Engelmann, is, however, considered doubtfully distinct from *J. Leseurii*.

At the end of the monograph, pp. 468 to 487, is given in tabular form the names as recognized by the author, of all the *Junci exsiccati* to be found in accessible herbaria.

The nomenclature adopted by the author varies somewhat from that followed by the leading botanists and other naturalists in this country. For example, if a species includes two or more forms, Buchenau usually gives to the form that was the type a varietal name, commonly var. *genuinus*. The custom followed by Gray, and now by almost all naturalists, is to allow the name of the species to stand for the form originally described, and to add varietal names only to forms subsequently described.

Juncus leptocaulis, Torrey and Gray, still retained by Buchenau, should be *J. filipendulus*, as pointed out by Britton.

Another point in nomenclature at variance with American custom is illustrated by the total loss of the Linnæan name *Juncus articulatus*. The species as originally described has been separated into two; and instead of adopting the Linnæan name for one of them, two later names are taken up.

As a whole, the work forms a very valuable working basis to the study of North American Juncaceæ, as it is the best present summary of our general knowledge of the group.

F. V. COVILLE.

Histology and Physiology of the Characeæ.—The "Botanisches Centralblatt," Vol. 44, Nos. 1 and 2, contains an article with the above title, written by Dr. Overton in the University of Zürich. The work is only fragmentary, being parts of results of experiments not yet finished. It was begun with the aim to discover the nature and function of the peculiar little bodies known in German as wimperkörperchen, ciliated bodies, which float about with the rotating protoplasm; also with the hope that by following closely the processes concerned in the development of the spores, some light might be thrown on the relationship of this group to others, and some points obtained regarding the morphological signification of the central canal cell of the Archegoniata.

In regard to this hope the author says the obstacles to overcome were greater than he had supposed, and that so far, he has been able to ascertain very little with definite certainty. After giving the method of studying the fertilization of the egg and explaining the difficulties in the way of following the successive steps of development, he says that the commonly received opinion that the outer membrane of the spore, on ripening, becomes lignified is entirely without support. His experiments proved conclusively that this membrane is cuticularized or suberized, but never lignified. In describing the markings of the shell of these spores, he says it is quite possible to decide the various species by the difference of these markings.

In regard to the wimperkærperchen the results were more satisfactory. Even here no conclusion as to their function was reached. The plant which served as material for this part of the work was *Nitella syncarpa* and was taken from the Zürich lake. These bodies were found in cells of nearly all parts of the plant but especially in the long internodal cells of the main portion. They were found to consist of albuminous matter and tannin. Other bodies occurring in the same cells are described as having the appearance of clear bubbles, some of which are as large as the ciliated bodies. Both of these structures, he says, have been mistaken for the cell nucleus, and states that much uncertainty in reference to their origin, nature and function has hitherto existed. He claims that they are in no way related to the cell nucleus, but that the so-called bubbles have the same chemical composition as that of the ciliated bodies, and that probably the latter are merely developed stages of the former. As proof of this he mentions that transition stages of various kinds were seen, and adds, that as the ciliated bodies were not found in the act of division, it is quite probable that they multiply only while in the form of bubbles, afterwards developing into the full-fledged body.

In regard to their behavior towards reagents and coloring matters, they are not unlike the protein grains found in *Ricinus* seeds. The fact that they are found in very young cells, where chlorophyll grains have only just made their appearance, being few in number and only slightly colored, suggests the possibility of their connection with the process of assimilation. On the

other hand, as they occur so frequently and in such great numbers in old cells which are in the process of dissolution, the inference here is that they play no part in the nutritive processes of the plant. It is somewhat singular that while they were found in such abundance in the *Nitella* plants, in all the different species of *Chara* used in the course of these experiments no wimper kærperchen were seen.

E. L. G.

Statistics of the Fertilization of Flowers.—In the “Verhandlungen des Botanischen Vereins der Provinz Bradenburgh” xxxi, 1-63, is an article by E. Loew on “Blütenbiologischen Statistik.” In this he gives the results of his investigations, in which he followed the method of Herman Müller in his work on the fertilization of flowers by insects.

This method was that of actually counting the visits of insects to flowers, made in such a manner as to secure the fertilization of one flower by the pollen from another. Müller records 10,000 instances of this kind counted by himself, and by a comparison of Alpine flowers and insects with those of north and middle Germany he reached the following conclusion; that the ancestors of certain Alpine flowers, such as *Viola calcarata*, *Rhinanthus alpinus*, &c., &c., must have emigrated from Germany into the Alpine regions as bee or humming bird flowers; that is, flowers adapted to fertilization by means of bees or humming birds, and these gradually changed their morphology so as to become butterfly flowers, owing to the much greater number of butterflies in that region than of bees or humming birds.

Loew says of this conclusion, that in the minds of certain biologists, Müller’s keenness of reasoning has caused a distrust of his method of work, therefore it seemed to him important to repeat the work of Müller under circumstances differing as widely as possible from those surrounding the plants studied by the latter. This he did by using the same method on plants growing in the botanical garden in Berlin, for a series of years. In this manner the conduct of insects, similar to those of Westphalia and Thuringen, could be observed in regard to flowers of all possible origin. The author, after giving several tables showing the number of visits as actually counted, says the results confirm the con-

clusions reached by Müller. He follows these statements by similar tables made during a series of years in different localities; he also gives the results obtained by McLeod in Ghent and by Lindmann in other northern regions.

As all of these results point in the same direction, except in certain instances which admit of a reasonable explanation, he says the mutual dependence of these plants and animals can best be expressed as follows: Those insects and flowers which theoretically may be considered as influencing each other in respect to their mutual adaptation to this method of fertilization are those which in reality do influence each other the most strongly.

This expression, he says, is the same as that stated by Müller, though in somewhat different terms, and adds, that it has not yet been confirmed by actual statistics, but when this has been done a very important biological law will have been discovered, and one which will serve to make clear other points now in obscurity. His work in the botanical garden of Berlin was undertaken to prove that Müller's general methods were trustworthy, but he prefers another method of classification of flowers and flower-fertilizing insects, and for this reason he purposely selected a limited territory for his field of observation, as in this way the worth of his classification would best be made evident.

In order to see how his particular method applied to larger stretches of country, other observations were made at different intervals, in various localities and the results arranged in a similar manner; finally he states that the comparison of all the observations so far made, lead to the probability of the truth of Müller's conclusion, and that further work in this same manner is necessary to establish this conclusion as a fact.

E. L. G.

Note sur un Nouveau Parasite dangereux de la Vigne. (Uredo Vialæ, sp. nov). M. de Lagerheim, Professeur a l'Université de Quito (Equateur). Rev. Gen. de Bot. 15 Sept., 1890.

Uredo Vialæ, a new fungus destructive to Grape Vines, was found on the leaves of a Vitis near a country house between Kingston and Rockfort on the Island of Jamaica and is named in honor of M. Pierre Viala of the National School of Agriculture at Montpellier.

It must not be confused with *Uredo Vitis*, Thümen, which latter, according to M. Viala, is neither an *Uredo* nor even a fungus. The specimens distributed under that name among the exsiccatae of Von Thümen are identical with the original specimens of Ravenel in the herbarium at Philadelphia and in that of Curtis at Cambridge. The cause of the error "is an affection common enough on vines planted on the sands of the sea shore and is a of physiological and accidental nature. The cells of the epidermis undergoing a change are isolated by desiccation, and, on account of their reddish color, might easily in a superficial examination be taken for the spores of an *Uredo*."

Uredo Vialæ is therefore the first of the Uredineæ known on a *Vitis* with any degree of certainty.

Von Thümen reports no less than 323 species of fungus parasitical on *Vitis vinifera* alone and as many of the most destructive of them in Europe have come from America, this note on the subject is a warning to agriculturists to be on the lookout for another enemy.

A second new species of *Uredo* very closely resembling *U. Vialæ* was found by M. de Lagerheim in the neighborhood of Quito on the leaves of *Cissus rhombifolia*, Vahl? and is described provisionally under the name of *Uredo Cissi*.

A. M. V.

British Moss Flora, II. Part XIII. R. Braithwaite. (London, Aug. 1890, pp. 105-144; t. LXI-LXVI.)

This fine work continues to improve in the illustrations, which in this part are excellent. Of the species figured there are 17 American as follows: *Splachnum ampullaceum*, L., *S. vasculosum*, L., *Tetraplodon bryoides*, (Zoega) Lindb. (*T. mnioides*, Br. Sch.); *T. angustatus*, (Sw.) Br. Sch., *Tayloria lingulata*, (Dicks.) Lindb. (*Dissodon splachnoides*, Grev.); *Discelium nudum*, (Dicks.) Brid., *Amblyodon dealbatus*, (Dicks.) P. Beauv., *Nanomitrium tenerum*, (Bruch) Lindb., *Physcomitrella patens*, (Hedw.) Br. Sch., *Physcomitrium pyriforme*, (L.) Brid., *Funaria attenuata*, (Dicks.) Lindb., (*Entosthodon Templetoni*, Schwaegr.); *Funaria calcarea*, Wahlenb. including *F. Mediterranea*, Lindb., *F. microstoma*, Br. Sch., *F. hygrometrica*, (L.) Sibth., *Oreas Mieliichhoferi*,

(Funck) Brid. (*Mielichhoferia nitida*, Hornsch.); *Leptobryum pyriforme*, (L.) Wils. and *Pohlia acuminata*, Hornsch. (*Webera acuminata*, Schimp). We commend this work to students of American mosses, for its conscientious historical research and concise descriptions. E. G. B.

Monographie der Gattung Stylosanthes. P. Taubert. (Verhand. Bot. Ver. Brandenburg, xxxii. Reprinted).

This is the first time since the publication of De Candolle's *Prodromus* Vol. ii, in 1825, that the species of this Leguminous genus have been treated of collectively. Herr Taubert now recognizes 22. Of these two are North American: *T. biflora* (L.) B. S. P. (*S. elatior*, Sw.; *Trifolium biflorum*, L.) the binomial attributed by the author to himself, probably not being informed of the fact that it was used in 1888 by the authors of the Preliminary Catalogue of Plants growing within one hundred miles of New York, and *S. hamata* (L.), Taub. (*S. procumbens*, Sw.; *Hedysarum hamatum*, L.), the latter a common West Indian plant, occurring also in Florida and including, according to him, Curtis No. 609 from Tennessee. *S. Schaffneri* from Mexico, *S. sympodialis* from Ecuador and *S. Pohliana* from Brazil are described as new. Of the 22 species, only five occur in the Old World. Herr Taubert, it will be noticed, maintains the earliest specific names. N. L. B.

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Abies Fraseri. (Gard. Chron. viii. 684, 685, fig. 132).

Abrus præcatorius.—*Ueber.* Prof. Kobert. (Sitzungsb. Naturf. Gesell. Dorpat, ix. 114-117).

Araucaria imbricata. (Gard. Chron. viii. 587, 588, figs. 117, 118 also full page illustration).

Aristolochia grandiflora. (Gard. & For. iii. 596, figs. 78-80).

This remarkable plant, native of the West Indies and tropical America generally, has recently flowered at the nursery of Mr. E. D. Sturtevant, at Bordentown, N. J. The flowers are among the largest of any known, one reaching the extraordinary dimensions of twelve by eighteen inches, with forty-two inches of tail, or a total length of five feet.